REMARKS

I. Introduction

Applicants would like to thank Examiner Patterson for issuing a non-final Office Action in view of Applicants' arguments presented in the Amendment filed November 22, 2004 and the telephonic interview conducted on December 9, 2004. In response to the Office Action dated December 13, 2004, Applicants have amended claims 1-3, 13-15 and 65 so as to further define the claimed invention. Support for these amendments can be found, for example, at page 17, Table 1, and pages 54-55 of the specification. No new matter has been added.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

II. The Rejection Of The Claims Under 35 U.S.C. § 102

Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by USP No. 5,866,228 to Awata. Applicants respectfully traverse this rejection for at least the following reasons.

In the pending rejection, the Examiner has withdrawn the rejection of claim 1 under 35 U.S.C. §103(a) as being unpatentable over Awata in view of the "Encyclopedia of Polymer Science and Engineering" (hereinafter "EPSE"). Nonetheless, the Examiner relies on col. 4, lines 39-43 as allegedly disclosing a seal layer such that claim 1 is anticipated by Awata. Specifically, the Examiner reads the inner-layer film 2 of Awata as the claimed "seal layer." However, Applicants respectfully disagree with the Examiner's interpretation, because the inner-layer film 2 of Awata necessarily forms part of the "three-layered structure," rather than being readable as a ***separate*** and ***distinct*** seal layer for supporting the alleged laminate film comprising the alleged support layer, deposition layer and protective layer. Without the inner-layer film 2,

the three-layered vacuum heat insulator of Awata would be incomplete. Indeed, it appears that the seal portion 5 (which is illustrated in Fig. 1) is formed by a junction comprising the inner-layer film 2 so as to provide the vacuum heat insulator of Awata the necessary heat sealing property. Accordingly, it is respectfully submitted that Awata does not disclose a separate and distinct "seal layer" which forms a seal portion together with a support layer, a deposition layer and a protective layer making up the alleged laminate film. For this reason, it is respectfully submitted that Awata does not disclose or suggest a laminate bag comprising a seal portion formed by junction of a fourth seal layer and a laminate film comprising a support layer, a deposition layer and a protective layer, as recited by claim 1.

Even assuming *arguendo* that the Examiner's interpretation is proper, it is clear that in doing so, the hypothetical heat insulator devised by the Examiner would otherwise contain only the alleged protective layer 4, alleged deposition layer 3 and the alleged seal layer 2, and would not contain the claimed support layer.

Even further, such a seal layer is NOT even needed in the vacuum heat insulator of Awata because the inner-layer film 2 readily provides the necessary heat sealing function without having the need to use Freon-polyurethane foam to supply the vacuum heat insulator with low heat conductivity, thereby suppressing any environmental problems caused by Freon-polyurethane foam (see, col. 1, lines 15-47).

Accordingly, as anticipation under 35 U.S.C. § 102 requires that each element of the claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference, *Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983)*, and at a minimum, Awata fails to disclose or suggest the foregoing claim elements, it is clear that Awata does not anticipate claim 1.

III. The Rejection Of Claims 1 and 7 Under 35 U.S.C. § 103

The Examiner has rejected claims 2-3, 13-15 and 65 under 35 U.S.C. § 103 as being unpatentable over Awata in view of the EPSE. The rejection is respectfully traversed for at least the following reasons.

With regard to claim 2, the Examiner continues to rely on the EPSE for allegedly disclosing polyethylene terephthalate (PET) polymers having glass transition temperatures ranging from 67-140°C, so that the claimed glass transition temperature would be readily determined from such a temperature range through "routine optimization by one having ordinary skill in the art depending on the desired end use of the product."

However, the Examiner's reliance on Awata to allege that discovering the optimum or workable range involves only routine skill in the art is improper because the Examiner has ***not*** established any result effective variable. The Examiner is directed to **M.P.E.P. § 2144.05(II)(B)** under the heading "Only Result-Effective Variables Can Be Optimized", which sets forth the applicable standard:

> A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. (citing *In re Antonie*, 195 USPQ 6 (CCPA 1977)).

In the instant case, because the Examiner has not referenced a result-effective variable in Awata, i.e., a variable which achieves a recognized result, pursuant to the cited MPEP section above, optimum or workable ranges of the claimed parameters can NOT be characterized as routine experimentation.

Even assuming *arguendo* that the Examiner's conclusion is proper, the Examiner's allegation that the polyvinyl alcohol-based film of Awata is used interchangeably as a PET film is not understood. Specifically, the Examiner asserts that the inner plastic film 2 comprising a

polyvinyl alcohol-based film (see, col. 6, lines 45 and 54-56) is interchangeable with a polyester film (see, col. 4, lines 25-26), and therefore can be modified into a PET film.

However, it is respectfully submitted that the Examiner improperly asserts that the inner plastic film 2 of Awata comprises a polyvinyl alcohol-based film ***without*** providing any support for the allegation, and moreover, the Examiner ***uses*** that unfounded allegation to further support the allegation that the polyvinyl alcohol-based film is interchangeable with a polyester film, and therefore is also interchangeable with a PET film so as to arrive at a PET film having glass transition temperatures ranging from 67-140°C. Without any support or rationale presented in support of the Examiner's allegations, it is difficult for the Applicants to provide a proper rebuttal. As best understood, the Examiner is apparently assuming that because Awata discloses a polyester/aluminum/polypropylene (i.e., alleged protective layer/alleged deposition layer/alleged support layer) structure, then the vacuum heat insulator of Awata must also be the same as that of the present invention. However, this analysis completely ignores the fact that Awata ***specifically*** discloses utilizing a polyvinyl alcohol-based film as ***only*** the metal layer 3, rather than as the plastic film 2 (see, col. 4, lines 30-35). As such, the Examiner's analysis that the polyvinyl alcohol-based film of the alleged deposition layer of Awata is used interchangeably with a polyester film and further with a PET film so as to arrive at the ***claimed support layer*** having a glass transition point of 87°C would not result, because the polyvinyl alcohol-based film is directed to the ***alleged deposition layer***, while the polyester film or the PET film is used only as the ***alleged protective layer***.

Again, even assuming *arguendo* that the polyvinyl alcohol-based film of Awata can be used interchangeably with a polyester film that can be modified into a PET film in the manner perceived by the Examiner, the Examiner is directed to **M.P.E.P § 2143.01** under the heading

"THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE" which sets forth the applicable standard:

> If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

In the instant case, it is respectfully submitted that the proposed modification of Awata would render Awata inoperable for its intended purpose. Specifically, Awata discloses a laminate film having a structure of outer-layer film 4/metal layer 3/inner-layer film 2, wherein a film having excellent heat sealing property is utilized as the inner-layer film 2 for providing the necessary heat insulating function. As such, if the inner-layer film 2 (alleged support layer) comprising an imaginary polyvinyl alcohol-based film as alleged in the pending rejection is replaced by a polyester film, and is further modified into a PET film in the manner constructed by the Examiner, an end product having an outer-layer film/metal layer/PET film structure necessarily results. As such, because the pending rejection has not provided any requisite objective evidence ***from the prior art*** in supporting the argument that the PET film as the inner-layer film 2 has any heat sealing property, the proposed modification to replace the inner-layer film 2 with a PET film would likely render Awata inoperable in which the vacuum heat insulator of Awata would no longer have any heat insulating property. It is important to note that Awata specifically discloses using a polypropylene film, and not a polyvinyl alcohol-based film, as the inner-layer film 2. As such, if the Examiner continues to maintain the pending rejection, it is respectfully requested that the Examiner provide evidence as to how a PET film is arrived by modifying the polypropylene film of Awata in view of the EPSE so as to afford the Applicants an opportunity to further rebut and/or address the Examiner's proposed modification.

Additionally, the Examiner merely alleges that the proposed modification to replace the polyvinyl alcohol-based film of Awata with a PET film having glass transition temperatures ranging from 67-140°C would have been obvious in view of routine optimization. However, outside of Applicants' specification, the record evidences that the polypropylene film of Awata ***is*** the desired alleged support layer because it has excellent heat sealing property. As such, it is respectfully submitted that the proposed combination is based solely on improper hindsight reasoning, whereby the pending rejection has selected bits and pieces of the claimed invention from plural references and used only Applicants' specification as a guide to reconstruct the claimed invention. Therefore, the proposed combination fails to establish *prima facie* obviousness of the pending claims.

Indeed, similar to the vacuum heat insulator of Awata and as described throughout the admitted prior art section of the specification, in the conventional vacuum heat insulator, a PET film or a polypropylene film is used as the support layer, an aluminum film is used as the deposition layer, and a PET film is used as the protective layer (see, e.g., page 2, 2nd paragraph to page 3, 1st paragraph). However, Applicants have discovered that when the conventional heat insulator is placed at a high temperature environment exceeding 90°C, the layers supporting the deposition layer expand or shrink thermally, causing the deposition layer to crack due to difference in coefficient of expansion between the layers. Through this crack, the air invades into the conventional vacuum heat insulator, and the internal pressure of the conventional vacuum heat insulator rises. As a result, when thermal stress is applied, the insulating performance of the conventional vacuum heat insulator deteriorates. Additionally, Applicants have further discovered that because the PET film used as the protective layer is poor in thermal dimensional stability and is also thin in thickness, the deposition layer is often cracked by

thermal shrinkage or contraction of this PET film. As a result, the gas barrier performance of the conventional vacuum heat insulator declines, preventing the insulator to operate desirably. Accordingly, by using a plastic film having a glass transition point of 100°C or higher as the support layer, or a plastic film having a glass transition point of 100°C or higher as the protective layer, the present invention advantageously provides a vacuum heat insulator having an excellent heat insulating performance even if it is placed under a high temperature environment or if thermal stress is applied.

In this regard, Awata and the EPSE, at best, are merely cumulative to Applicants' admitted prior art disclosed on pages 1-6 of Applicants' specification with respect to using a polypropylene film as the support layer, an aluminum film as the deposition layer, and a PET film as the protective layer. Accordingly, Awata and the EPSE are also subject to the same drawbacks as those of the conventional vacuum heat insulator, identified by the instant inventors at page 3, 1st to 3rd paragraph of Applicants' specification. Only Applicants' specification identifies the problems associated with the conventional vacuum heat insulator, and provides the means by which to overcome these problems. In other words, the proposed combination is based solely on improper hindsight reasoning, utilizing Applicant's specification as a guide to pick and choose the selected elements from different prior art references so as to reach the claimed invention.

Thus, for all of the foregoing reasons, it is respectfully submitted that Awata and the EPSE, take alone or in combination, do not disclose or suggest "[a] support layer comprising a plastic film having a glass transition point of 100°C or higher."

Nonetheless, in order to advance prosecution and in an effort to assist the Examiner understanding the foregoing distinction, claim 1 has been amended to recite "[a] support layer

comprising a plastic film having a glass transition point of 100°C or higher." Specifically, in accordance with one exemplary embodiment of the present invention, when a plastic film having a glass transition point of 100°C or higher, such as a polyethylene naphthalate, is used as the support layer 412, a vacuum heat insulator having an extremely high durability performance is obtained. In contrast, as noted at pages 569 and 580 of The Contemporary Polymer Chemistry by Harry R. Allcock and Frederick W. Lampe (copy enclosed herewith), PET and polypropylene films only have a glass transition point of 69°C, and 26 to -35°C, respectively. Thus, for all of the foregoing reasons, it is respectfully submitted that Awata and the EPSE, take alone or in combination, do not discuss or even recognize any film having any glass transition point of 100°C or higher, let alone disclose utilizing a plastic film having the foregoing claimed glass transition point ***specifically*** for the support layer. Accordingly, it is respectfully requested that claim 1 is patentable over the cited prior art, and Applicants respectfully request that the rejection of claim 2 under 35 U.S.C. § 103(a) be withdrawn.

With respect to claim 13, this claim recites in-part "the protective layer comprising a plastic film having a glass transition point of 100°C or higher." In the "Response to Applicants' Argument" section of the pending Office Action, the Examiner asserts that "although excellent insulating performance appears to be maintained at the claimed glass transition point, no comparison can be made to glass transition points outside that range to determine if unexpected results are observed in the claimed range."

However, as discussed at page 2, 2nd paragraph of the specification, Applicants have discovered that when a plastic film of polyamide-6 (tradename 6-Nylon) having a glass transition point of 50°C is used, due to difference in coefficient of thermal expansion between the layers of the conventional vacuum heat insulator, cracks are often formed at high temperature, preventing

the conventional vacuum heat insulator from operating normally. Applicants have further discovered that the insulating performance of the conventional vacuum heat insulator deteriorates, because air invades into the conventional vacuum heat insulator through the cracks, causing the internal pressure of the conventional vacuum heat insulator to rise. Even further, Applicants have discovered that as the gas molecule inside the conventional vacuum heat insulator becomes higher in temperature, its kinetic energy increases geometrically. As a result, at high temperature, the vacuum inside the conventional vacuum heat insulator cannot be maintained, thus further weakening the insulating performance of the conventional vacuum heat insulator. Accordingly, by providing a protective layer comprising a plastic film having a glass transition point of 100°C or higher, the vacuum heat insulator of the present invention having an extremely high durability and insulating performance is a significant improvement over the prior art insulator, and only Applicants have recognized and considered the aforementioned prior art problems, provided the means by which to overcome such problems, and discovered the benefits set at the claimed glass transition point.

In an event that the argument that the PET polymers having glass transition temperatures ranging from 67-140°C as disclosed in the EPSE is maintained, and clear and convincing evidence from the cited prior art regarding the deficiencies of the foregoing new and unexpected results argument is provided, it is noted that amended claim 15 specifically recites that the plastic film of the protective layer comprises at least one of polyethylene naphthalate, polycarbonate and polyimide. As is apparent from the cited prior art, Awata is silent with regard to any of the foregoing films, let alone suggest utilizing it ***specifically*** as the alleged protective layer. For at least these reasons, it is respectfully submitted that claim 13 is patentable over the cited prior art,

and Applicants respectfully request that the rejection of claim 13 under 35 U.S.C. § 103(a) be withdrawn.

Furthermore, with respect to claim 65, as this claim also includes the feature "wherein the first support layer comprises a plastic film having a glass transition point of 100°C or higher" and "the third protective layer comprises a plastic film having a glass transition point of 100°C or higher," it is respectfully requested that claim 65 be allowed for reasons similar to those discussed above with respect to claims 2 and 13.

Based on all the foregoing, it is submitted that claim 65 is patentable over Awata. Accordingly, it is respectfully requested that the rejection of claim 65 under 35 U.S.C. § 103 over Awata in view of the EPSE, be withdrawn.

IV. All Dependent Claims Are Allowable Because The Independent Claims From Which They Depend Are Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co., 819 F.2d at 1100, 1108 (Fed. Cir. 1987).* Accordingly, as independent claims 1, 2, 13 and 65 are patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also in condition for allowance.

V. Conclusion

Accordingly, it is urged that the application is in condition for allowance, an indication of which is respectfully solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Michael E. Fogarty
Registration No. 36,139

Please recognize our Customer No. 20277 as our correspondence address.

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 MEF/AHC
Facsimile: 202.756.8087
Date: **March 14, 2005**